

Multimorbidity, depression and quality of life among elderly people assisted in the Family Health Strategy in Senador Guimard, Acre, Brazil

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Abstract *This study analyzed the association between multimorbidity, depression and quality of life among the elderly in the Family Health Strategy (FHS). A cross-sectional study was conducted among the elderly in the FHS in Senador Guimard (State of Acre). The study employed the Geriatric Depression Scale (GDS-15) and the Quality of Life Questionnaire (WHOQOL-BREF). Differences in descriptive variables in elderly people with and without multimorbidity were estimated using Pearson's chi-squared test, while the associations between multimorbidity and depression and quality of life were estimated using the logistic regression technique. It was seen that elderly people with depression represented 27% of the sample, this being more prevalent among elderly people with multimorbidity than those without, the former being twice as likely to be subject to depression. Likewise, individuals with multimorbidity had a greater chance of worse quality of life in the physical, social and total quality of life domains (all with $p \leq 0.010$), though not in the environmental domain ($p = 0.493$). Thus, multimorbidity in the elderly is associated with the presence of depression and poor quality of life, which imposes the challenge on the FHS of guaranteeing the elderly living out their senescence without suffering and diminished quality of life.*

Key words *Morbidity, Depression, Quality of life*

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Introduction

Aging involves a process whereby the human organism is subject to several physiological changes that lead to a natural reduction of given capacities of the body that are strongly differentiated in accordance with living conditions¹. In this process, several chronic conditions may arise that are usually characterized by gradual onset, an uncertain outcome, being of long duration and maybe leading to possible disabilities²⁻⁴.

The occurrence of two or more diseases in the same individual is termed multimorbidity^{5,6}. It is considered a public health problem due to its negative impact on the individual's quality of life and life expectancy⁷⁻⁹. Nonetheless, despite advances and new techniques for approaching and controlling multimorbidity, handling this problem appropriately is a challenge for contemporary public health systems and services¹⁰⁻¹⁴.

The process of demographic transition in Brazil, characterized by the sharp rise in the elderly population compared to other age groups, has been occurring since the second half of the twentieth century. The number of Brazilian elderly people rose from 3 million in 1960 to 7 million in 1975, and to 14 million in 2002. It is estimated that this number will reach 32 million by the year 2020¹⁵. In the last demographic census taken in Brazil, 10.79% of the population were 60 or more years old, corresponding to 20 million individuals¹⁶.

Among the different morbidities that afflict the elderly population, depression has become an important problem, defined as disturbance of a person's ability to be affectionate or of their mood, with significant functional impact on any age group. The worldwide prevalence of depression in elderly people varies from 0.9% to 9.4% of those living in private households and from 14% to 42% among those living in institutions¹⁷. Brazilian studies indicate that between 19% and 34% of the elderly population residing in private households have symptoms of depression, depending on what region of the country they live in¹⁸⁻²¹.

Among the factors associated with depression in the elderly, the highlights – besides demographic variables such as sex, advanced age and low levels of schooling, tobacco usage, cardiovascular, endocrinal, neurological and oncologic diseases, as well as a greater number of medicines being used on a daily basis – include functional disabilities, negative perception of their own health, low level of regular physical activity and insomnia^{22,23}.

Multimorbidity in the elderly has proven to be a factor that contributes to the potential development of depression. A Brazilian survey conducted of elderly people assisted by the Family Health Strategy in Dourados, State of Mato Grosso do Sul (MS), showed that 27% of elderly participants had at least 3 (three) chronic diseases and depressive symptoms. When the number of chronic diseases rose to 5 (five), depression affected almost half (48.1%) of elderly people²⁴.

A survey conducted in Spain of 471 elderly people revealed the prevalence of depressive symptoms in 19.7%, with such symptoms being associated with the presence of multimorbidity²⁵. In Singapore, a positive association was also noted between the presence of chronic diseases and the sensation of isolation among the elderly, this being considered a symptom of depression²⁶, which reinforces the existence of a direct relationship between depression and multimorbidity.

In a study carried out in 2010 among elderly people assisted by the Family Health Strategy in the municipality of Senador Guiomard (State of Acre), it was noted that individually, hypertension and cardiovascular disturbances, for example, are associated with both the total quality of life and the domains of quality of life²⁷. It should be stressed that in the entire state of Acre, elderly people corresponded in that year to 4.32% of the population, although in Senador Guiomard the proportion rose to almost twice that percentage (7.91%)¹⁶.

Therefore, the scope of this investigation has been to analyze the association between the presence of multimorbidity and symptoms of depression and quality of life in elderly people registered with the Family Health Strategy in Senador Guiomard, Acre.

Methods

The cross-sectional study conducted was part of the project entitled "Conditions of health, quality of life and depression in elderly persons assisted under the Family Health Strategy in Senador Guiomard, Acre." It was carried out in the months of August and September of 2010, and involved elderly people assisted by the Family Health Strategy in the urban zone of the municipality of Senador Guiomard, State of Acre.

Probabilistic sampling was carried out based on the elderly population registered with the Family Health Strategy, which in that year meant 100% coverage. The sampling and data gathering procedures have already been described²⁷.

Thus, participating in the study there were 264 elderly people of both sexes, between the ages of 60 and 102, who responded to a questionnaire structured into thematic modules that dealt with socio-demographic and economic data, lifestyle habits, presence of morbidities, quality of life and depression.

In this investigation, multimorbidity, analyzed as a dependent variable, was constructed based on the self-reports of the elderly who had been previously diagnosed by a health-care professional as having the following morbidities: hypertension, diabetes, cardiovascular disorder [poor circulation, cerebrovascular accident (CVA or stroke) and heart problem], musculoskeletal disorder (spinal problem, rheumatism, arthritis/arthrosis and osteoporosis), as well as insomnia, cataracts, anemia and gastrointestinal/urinary disorders. The definition of multimorbidity adopted was the simultaneous occurrence of two or more diseases in the same individual⁶.

Depression, treated as an independent or explanatory variable, was identified using the Geriatric Depression Scale (GDS-15), adopting the cut-off point of 5/6 points for non-case/case as being suggestive of the disorder²⁸.

The quality of life independent or explanatory variable was obtained by means of the abbreviated version of the World Health Organization Quality of Life Assessment (WHOQOL-BREF)²⁹. The scores for the physical, psychological, social, environmental and total quality of life domains were analyzed in tertiles.

The following were treated as adjustment variables: sex; age ("60-69," "70-79" and "80 or more"); schooling ("illiterate/grade school – 1 incomplete" and "grade school – 1 complete or more"); companionship situation ("with companion" and "without companion"); and economic classification, which was obtained through the Brazilian Criterion for Economic Classification³⁰. The latter considers the purchasing power of people in the following classes: A1 (very wealthy), A2 (wealthy or upper), B1 (higher upper middle), B2 (lower upper middle), C1 (middle), C2 (lower middle), D (lower) and E (poor). In this study, it was decided to divide the group into just two classes "B/C" (middle) and "D/E" (lower), in as much as none of the elderly people surveyed were classified as being class A.

In the descriptive analysis, the absolute and relative frequencies were checked for all the variables analyzed by sex, with the differences in the frequencies between the elderly persons with and without multimorbidity being subjected to Pear-

son's chi-squared test. Averages with their respective standard deviation (sd) were established for the quality of life domains, where the differences between the individuals with and without multimorbidity were subjected to Student's *t*-test for independent samples.

Non-paired logistic regression models were used to estimate the magnitude of association in odds ratio (OR), with their respective confidence intervals of 95% (CI95%), between the multimorbidity independent variable and each independent variable: depression and the domains of quality of life and total quality of life in tertiles, with the upper tertile being indicative of better quality of life as a reference. Three models were estimated: the first model centering on the gross association between multimorbidity and depression and each quality of life domain. The second model took into consideration the adjustment for the age groups and sex. In the third model, calculation was made of the association adjusted by age, sex, schooling, economic classification and companionship situation. In all the analyses, consideration was given to the level of significance being $\alpha = 0.05$. The data were analyzed with the aid of the Software Statistical Package for the Social Sciences (SPSS v.17).

The survey on which this research belongs was approved by the Research Ethics Committee of Acre Federal University, and all the participants signed the Informed Consent Form.

Results

In relation to the 264 elderly people assessed, the results of the study showed that 61% were females, 52.1% were 70 or more, 79.9% were either illiterate or had not finished grade school, 58% did not have a partner, 64% were ranked as being poor (i.e. in Brazilian economic classes D and E). Multimorbidity was identified in 66.3% of the persons interviewed, though no statistically significant differences were identified regarding distribution between the individuals with and without multimorbidity in the socio-demographic variables. The geriatric depression scale identified 27.3% of the elderly people as having depression, with a greater proportion of individuals with multimorbidity compared to those without (Table 1).

Lower averages were also noted in all the quality of life domains, except the environmental domain, among the subjects with multimorbidity, in comparison with those without the complaint (Table 2).

Table 1. Percentage distribution of descriptive variables of elderly persons assisted by the Family Health Strategy, according to multimorbidity, in the Municipality of Senador Guiomard-AC, Brazil, 2010.

Variables	Multimorbidity			p-value*
	Total n (%)	Yes n (%)	No n (%)	
Sex				0.094
Male	103 (39.0)	62 (35.4)	41 (46.1)	
Female	161 (61.0)	113 (64.6)	48 (53.9)	
Age group ^a				0.131
60-69	126 (47.9)	76 (43.7)	50 (56.2)	
70-79	90 (34.2)	66 (37.9)	24 (27.0)	
80 or more	47 (17.9)	32 (18.4)	15 (16.8)	
Schooling				0.179
Illiterate/Grade school – 1 incomplete	211 (79.9)	144 (82.3)	67 (75.3)	
Grade school – 1 complete or more	53 (20.1)	31 (17.7)	22 (24.7)	
Companionship situation				0.667
With companion	111 (42.0)	72 (41.1)	39 (43.8)	
Without companion	153 (58.0)	103 (58.9)	50 (56.2)	
Economic classification (ABEP)				0.125
B/C	95 (36.0)	67 (38.3)	28 (31.4)	
D/E	169 (64.0)	108 (61.7)	61 (68.6)	
Depression (GDS-15)				0.003
No	192 (72.7)	117 (66.9)	75 (84.3)	
Yes	72 (27.3)	58 (33.1)	14 (15.7)	
Total	264 (100)	175 (66.3)	89 (33.7)	

* Pearson's chi-squared test. a loss of information regarding age of one participant (n = 263).

Table 2. Average and standard deviation of quality of life (WHOQOL-BREF) domains of elderly people assisted by the Family Health Strategy, according to multimorbidity, in the Municipality of Senador Guiomard-AC, Brazil, 2010.

Variables	Multimorbidity			p-value*
	Total average ± sd	Yes average ± sd	No average ± sd	
Qualidade de Vida				
Físico	57.2 ± 11.46	55.3 ± 11.61	60.9 ± 10.23	< 0.001
Psicológico	63.8 ± 10.56	62.4 ± 10.42	66.5 ± 10.35	0.003
Social	62.4 ± 12.05	61.0 ± 12.53	65.2 ± 10.57	0.005
Ambiental	50.4 ± 7.97	50.0 ± 7.99	51.0 ± 7.95	0.360
Total	63.5 ± 15.00	60.6 ± 14.44	69.1 ± 14.54	< 0.001

* Student's t-test.

There was an association between the presence of multimorbidity and a lower score in the quality of life domains. After adjusting for sex, age, economic classification, schooling and companionship situation, the magnitudes of the associations varied from 2.54 to 5.14 times greater the chance of belonging to the lower tertile of

the quality of life in the physical, psychological, social and total quality of life domains since the elderly persons in question had multimorbidity. Likewise, elderly individuals with multimorbidity had 2.39 times higher chances of depression as indicated by the GDS (Table 3).

Table 3. Logistic regression analysis of the Geriatric Depression Scale (GDS) and the tertiles of quality of lifedomains (WHOQOL-BREF) with multimorbidity in elderly people assisted by the Family Health Strategy in the Municipality of Senador Guiomard-AC, Brazil, 2010.

Variables	OR (IC95%) (model 1)*	OR (IC95%) (model 2)**	OR (IC95%) (model 3)***
Depression (GDS-15)			
Without depression	1	1	1
With depression	2.66 (1.38-5.10)	2.44 (1.26-4.75)	2.39 (1.23-4.68)
Quality of lifedomains			
Physical			
Upper tertile	1	1	1
Middle tertile	1.73 (0.94-3.17)	1.63 (0.87-3.07)	1.69 (0.89-3.21)
Lower tertile	3.05 (1.56-5.95)	2.97 (1.42-6.22)	2.90 (1.37-6.16)
p trend	0.001	0.004	0.005
Psychological			
Upper tertile	1	1	1
Middle tertile	1.49 (0.79-2.82)	1.26 (0.65-2.43)	1.30 (0.67-2.52)
Lower tertile	2.70 (1.39-5.26)	2.58 (1.30-5.12)	2.54 (1.26-5.10)
p trend	0.003	0.008	0.010
Social			
Upper tertile	1	1	1
Middle tertile	2.28 (1.20-4.35)	2.55 (1.32-4.93)	2.56 (1.32-4.98)
Lower tertile	2.53 (1.25-5.11)	2.64 (1.29-5.42)	2.71 (1.30-5.66)
p trend	0.003	0.002	0.002
Environmental			
Upper tertile	1	1	1
Middle tertile	1.13 (0.62-2.05)	1.10 (0.60-2.01)	1.09 (0.59-2.00)
Lower tertile	1.22 (0.64-2.32)	1.27 (0.66-2.43)	1.27 (0.65-2.48)
p trend	0.536	0.481	0.493
Total			
Upper tertile	1	1	1
Middle tertile	2.81 (1.56-5.07)	2.60 (1.43-4.73)	2.65 (1.45-4.87)
Lower tertile	4.94 (1.94-12.56)	5.21 (2.00-13.55)	5.14 (1.96-13.51)
p trend	< 0.001	< 0.001	< 0.001

*Model 1: gross. **Model 2: adjusted per sex and age. ***Model 3: adjusted per sex, age, economic classification, schooling and companionship situation.

Discussion

Among the elderly people assisted by the Family Health Strategy in the municipality of Senador Guiomard, Acre, it was noted that the majority had multimorbidity, a condition that was most frequent among those classified as suffering from depression in accordance with the GDS. Nevertheless, insofar as the socioeconomic variables among elderly people with multimorbidity are concerned, they do not differ statistically from those without the condition.

The findings regarding the prevalence of multimorbidity in this study are echoed in im-

portant systematic review studies indicating that the prevalence of multimorbidity among the elderly is greater than that found among youths and middle-aged adults, varying from 55% to 98%³¹; frequencies were greater among elderly people assisted at primary care units³². In the city of Pelotas, State of Rio Grande do Sul, for instance, the prevalence of multimorbidity was 57.9% among people 60 years of age or older. Overall, among the general population over the age of 20, the prevalence of depression was higher (59.5%) among people with multimorbidity³³. In Bagé, another city in the State of Rio Grande do Sul, no less than 81.3% of elderly people had mul-

timorbidity³⁴, with this same population showing a prevalence of 18% of depression symptoms as measured on the GDS^{34,35}.

The prevalence of symptoms of depression among the elderly in Senador Guiomard was similar to that found in Dourados (Mato Grosso do Sul), where a figure of 34.4% was detected among those attended under the Family Health Strategy²⁴. In Spain, the depression ratio was 19.7% among the elderly and it was associated with the presence of co-morbidities and social risk²⁵. However, in this investigation, it was noted that the prevalence of depression among the elderly with multimorbidity was double that of depression of elderly people without multimorbidity, showing the impact of multimorbidity on affective health and mood, which are key areas related to depression¹⁷.

Depression is a mental disorder, a fact that partly helps us to understand its relationship with multimorbidity, in that psychic problems make people more susceptible to an increase in the number of diseases they have^{31,36}, with symptoms of depression being associated with a greater number of chronic diseases³⁷.

Contrary to the data identified in this investigation, it has been reported that multimorbidity is associated with advanced age, the female gender and low economic classification (i.e. poverty)^{31,38}. Highlights of the negative consequences of such a situation are functional decline and disabilities³⁹, diminished quality of life^{31,40}, increase in the demand for services and costs incurred in health-care, as well as a rise in the risk of mortality³⁸, which represents a serious public health problem.

In this sense, the rise in life expectancy involves an increase in living with chronic diseases, which in turn results in a rise in multimorbidity among the elderly. This situation in turn leads to an increase in the use of public health services, physical and functional disabilities and deterioration in quality of life⁴¹. In a Brazilian survey conducted in the city of Bauru in the State of São Paulo, it was confirmed that the number of morbidities was associated with lower quality of life scores⁴².

In an earlier study – analyzing the presence of hypertension, cardiovascular disorders, insomnia and anemia individually – it was possible to observe an association with lower scores in the quality of life domains, again with the exception of the environmental domain²⁷. In this investigation, elderly people with multimorbidity had greater chance of poorer quality of life (lower tertile), confirming the relationship between multimorbidity and a lower quality of life⁴¹. One possible explanation for this fact is that elderly

people who suffer from different chronic diseases must readjust their daily habits and their chores, and that this readjustment leads directly to a poorer quality of life⁴³.

In their search on aging in Germany, it was identified that there was a negative correlation between symptoms of depression and the number of chronic morbidities in the physical and psychological domains of quality of life. The German survey showed that, notwithstanding, there are indications that early social and emotional support appear to be promising alternatives for ensuring improved quality of life during the aging process as regards the physical and psychological domains⁴⁴. Accordingly, it becomes crucial to implement policies to strengthen social and family ties, creating support networks for healthy aging with the best possible quality of life.

Certain limitations are acknowledged in this investigation, such as the impossibility of making causal inferences owing to the cross-sectional design, which imposes the need to analyze the associations revealed with caution. Another limitation is the definition of self-reported morbidities, although self-reported chronic morbidities may express an approximate measure of the information obtained from clinical tests⁴⁵.

Despite the limitations cited, the representativeness of the survey of elderly people registered with the Family Health Strategy and the unprecedented nature of the study conducted in the region should be highlighted as positive points. This is because there are apparently no population studies oriented to the relationships of multimorbidity with depression and quality of life in elderly people, although studies oriented to morbidities and quality of life are indeed being conducted with increasing frequency in Brazil.

Conclusion

The findings of this study indicate that multimorbidity in elderly persons is strongly associated with the presence of symptoms of depression and poor self-perception of quality of life, except in the environmental domain. Accordingly, one major challenge for the Family Health System with respect to elderly people is to create mechanisms for more effective care, so as to reduce the impacts of senility on their quality of life and ensure that experience the process of reducing functional capacity – i.e. senescence – is not accompanied by suffering and diminished quality of life.

Collaborations

TLM Amaral participated in data collection, processing, analysis and interpretation of data, literature review and article writing; CA Amaral participated in data processing, literature review and article writing; PR Prado participated in the pro-

cessing, analysis and interpretation of the data; NS Lima participated in the processing, analysis and interpretation of data; PV Herculano participated in the processing, analysis and interpretation of data; and GTR Monteiro acted in the analysis and interpretation of data, critical review of the article and approval of the final version.

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